



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,627	03/01/2004	Brad N. Mathiowetz	P32.12-0022	1342
27367 7590 08/02/2007 WESTMAN CHAMPLIN & KELLY, P.A. SUITE 1400 900 SECOND AVENUE SOUTH MINNEAPOLIS, MN 55402-3319			EXAMINER CHUO, TONY SHENG HSIANG	
			ART UNIT 1745	PAPER NUMBER
			MAIL DATE 08/02/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/790,627	Applicant(s) MATHIOWETZ ET AL.	
	Examiner Tony Chuo	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/2/07 has been entered.

Response to Amendment

2. Claims 1-19 are currently pending. The amended claims 9 and 12 do not overcome the previously stated 102 and 103 rejections. Therefore, claims 9-16 and 18-19 stand rejected under the previously stated 102 and 103 rejections. The amended claim 1 does overcome the previously stated 102 and 103 rejections. However, upon further consideration, claims 1-8 and 17 are rejected under the following new 102 and 103 rejections.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 1745

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Ura et al (WO 01/080331) using (US 2003/0017383) as an equivalent English translation.

The Ura reference discloses a case for temperature regulation of an electrical energy storage cell comprising: a first layer that is a heat dissipating portion "4a" that is shaped to conform to a cylindrical portion of an outer surface of cell "2", wherein the heat dissipating portion terminates at first layer ends that are on the cylindrical portion of the outer surface of the cell; and a second layer that is a resin made pack case "1" that is shaped to cover an outer surface of the first layer and that extends beyond the outer surface to completely cover the first layer ends (See Figure 1 and 2 and paragraphs [0025]). It also discloses heat dissipating portions that are made of aluminum or copper (See paragraph [0022]).

Examiner's note: It is inherent that the battery comprises a hot spot during a short circuit and the heat dissipating portion would conduct the heat flow over a portion of the outer surface of the heat dissipating portion that is larger than the hot spot. It is also inherent that the resin case would retard the flow of heat to an outer surface such that the temperature of the outer surface of the resin case has a measured maximum temperature of 130 degrees centigrade or less during the short circuit condition. It is further noted that although Ura et al does not explicitly teach using the battery in a combustible atmosphere, a recitation of intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. Since the Ura battery

Art Unit: 1745

is capable of having an outer surface temperature that is lower than a temperature that can cause combustion in a combustible atmosphere, it meets the claims.

5. Claims 12 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Stafford et al (US 5763118). The Stafford reference discloses a process of covering the battery comprising: providing a battery cell "22"; covering a cylindrical portion of an outer surface of the battery with a first heat-conductor layer "42" that conforms with the cylindrical portion of the outer surface of the battery, wherein the first layer terminates at first layer ends on the outer cylindrical portion; and providing a second structural support outer layer "48" that completely covers the first heat-conductor layer (See column 3 line 67 to column 4 line 2 and column 4 line 56 to column 5 line 24 and Figures 1 and 3). It also discloses a first heat-conductor layer that comprises two thermally conductive half-shells "26a" & "26b" that each cover one side of a round surface of the battery (See column 4, lines 18-19).

Examiner's note: The first layer ends are construed as being the portions of the first heat conductor layer that form the interface between the two half-shells. It is inherent that the battery comprises a hot spot during a short circuit and the heat-conductor layer would conduct the heat flow over a portion of the outer surface of the heat-conductor layer that is larger than the hot spot. It is further noted that although Stafford et al does not explicitly teach using the battery in a combustible atmosphere, a recitation of intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. Since the Stafford battery is capable of having an

Art Unit: 1745

outer surface temperature that is lower than a temperature that can cause combustion in a combustible atmosphere, it meets the claims.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ura et al (WO 01/080331) using (US 2003/0017383) as an equivalent English translation, in view of Toyoda (JP 2001-243927). The Ura reference is applied to claim 1 for reasons stated above. However, Ura et al does not expressly teach a second layer of material that is heat-shrink tubing or an elastic material. The Toyoda reference discloses a heat shrink member "8" that covers a battery (See paragraph [0008]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Ura battery cover to include a second layer of material that comprises heat-shrink tubing or elastic material in order to improve the reliability of the outer package of the battery while simplifying the manufacture of the battery.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ura et al (WO 01/080331) using (US 2003/0017383) as an equivalent English translation, in view of Koehler et al (EP 0177225). The Ura reference is applied to claim 1 for reasons

Art Unit: 1745

stated above. However, Ura et al does not expressly teach a first layer that comprises two thermally conductive half-shells that each cover one side of a round surface of the energy storage cell. The Koehler reference discloses a cooling system for batteries that comprises cooling panels "15" & "16" that form thermally conductive half shells that each cover one side of a round surface of the energy storage cell (See Figure 6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Ura battery cover to include a first layer that comprises two thermally conductive half-shells that each cover one side of a round surface of the energy storage cell in order to increase the surface area of the heat dissipating portion that contacts the energy storage cells such that the thermal efficiency of the heat dissipating portion is increased.

9. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Miller et al (US 5204194).

The Stafford reference discloses a battery comprising: a plurality of battery cells "22", wherein each cell is covered by a first heat-conductor layer "42" that is shaped to conform to a cylindrical portion of an outer surface of the battery that terminates at first layer ends that are on the cylindrical portion of the outer surface of the battery cell and a second structural support outer layer "48" that is shaped to conform to and completely covers the outer surface of the first heat-conductor layer (See column 3 line 67 to column 4 line 2 and column 4 line 56 to column 5 line 24, and Figures 1, 3, & 5). It also discloses electrical contacts "34" (See column 4, lines 9-10).

Examiner's note: The first layer ends are construed as being the portions of the first heat conductor layer that form the interface between the two half-shells. It is

Art Unit: 1745

inherent that the battery would comprise a hot spot during a short circuit. It is also inherent that the structural support outer layer, made of a composite material with a polymeric matrix such as epoxy, would retard the flow of heat to an outer surface such that the temperature of the outer surface of the protection resin layer is lower than a temperature which can cause combustion in a combustible atmosphere. It is further noted that although Stafford et al does not explicitly teach using the battery in a combustible atmosphere, a recitation of intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. Since the Stafford battery is capable of having an outer surface temperature that is lower than a temperature that can cause combustion in a combustible atmosphere, it meets the claims.

However, Stafford et al does not expressly teach a protective device including a fusible link; electrical interconnections that interconnect the plurality of battery cells in a series circuit with the protective device and the electrical contacts; and a plastic resin shell shaped to receive the plurality of covered cells and the protective device. The Miller reference discloses a multicell battery comprising: a plurality of electrical energy storage cells "24" & "26"; a protective device including a fusible link "64" and electrical interconnections "50" that interconnect the plurality of electrical energy storage cells in series circuit with the protective device and the electrical connection leads; and a plastic resin shell "22" shaped to receive the plurality of covered cells and the protective device (See Figure 1 and 3 and column 3, lines 39-41).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford battery pack to include a protective device including a fusible link; electrical interconnections that interconnect the plurality of battery cells in a series circuit with the protective device and the electrical contacts; and a plastic resin shell shaped to receive the plurality of covered cells and the protective device in order to provide an overcurrent protection device that is easily and economically constructed.

10. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Miller et al (US 5204194) as applied to claims 9 and 10 above, and further in view of Maggert et al (US 6724170). However, Stafford et al as modified by Miller et al does not expressly teach a plastic resin shell that includes plastic resin separation bars positioned between the cells and the electrical interconnections to reduce shorting. The Maggert reference discloses a plastic casing "202" positioned between the cells and the electrical interconnections to prevent tabs from shorting (See column 3 line 66 to column 4 line 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Miller battery pack to include separation bars in the plastic resin shell in order to prevent the tabs from shorting to either tabs or other cell housings.

11. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Dansui et al (US 2003/0013009). The Stafford reference is applied to claim 12 for reasons stated above. However, Stafford et al does not expressly teach a first layer of material that comprises aluminum or copper. The Dansui reference discloses a battery housing that is made of aluminum or copper

Art Unit: 1745

(See paragraph [0013]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford housing support to include a first layer of material that comprises aluminum or copper in order to utilize a material that has excellent thermal conduction properties and is suited for suppressing a battery temperature rise.

12. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Toyoda (JP 2001-243927). The Stafford reference is applied to claim 12 for reasons stated above. However, Stafford et al does not expressly teach a second layer of material that is heat-shrink tubing. The Toyoda reference discloses a heat shrink member "8" that covers a battery (See paragraph [0008]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford housing support to include a second layer of material that comprises heat-shrink tubing in order to improve the reliability of the outer package of the battery while preventing the generation of an outside short circuit.

13. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ura et al (WO 01/080331) using (US 2003/0017383) as an equivalent English translation, in view of Iwasaki et al (US 6325611). However, Ura et al does not expressly teach a hot spot on the storage cell during an external short circuit. The Iwasaki reference discloses an external short circuiting test that forms a hot spot on the cell near the lead member by heat generation due to the resistance of the lead member (See column 7, lines 13-22). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Ura battery pack to include a hot spot on the storage

Art Unit: 1745

cell during an external short circuit in order to confirm that the battery can maintain high safety even under the application of an extraordinarily high charge voltage.

14. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Miller et al (US 5204194) as applied to claim 9 above, and further in view of Iwasaki et al (US 6325611). However, Stafford et al as modified by Miller et al does not expressly teach a hot spot on the storage cell during an external short circuit. The Iwasaki reference discloses an external short circuiting test that forms a hot spot on the cell near the lead member by heat generation due to the resistance of the lead member (See column 7, lines 13-22). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Miller battery to include a hot spot on the storage cell during an external short circuit in order to confirm that the battery can maintain high safety even under the application of an extraordinarily high charge voltage.

15. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Iwasaki et al (US 6325611). The Stafford reference is applied to claim 12 for reasons stated above. However, Stafford et al does not expressly teach a hot spot on the storage cell during an external short circuit. The Iwasaki reference discloses an external short circuiting test that forms a hot spot on the cell near the lead member by heat generation due to the resistance of the lead member (See column 7, lines 13-22). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford battery to include a hot spot on the storage cell during an external short circuit in order to confirm

Art Unit: 1745

that the battery can maintain high safety even under the application of an extraordinarily high charge voltage.

Response to Arguments

16. Applicant's arguments filed 7/2/07 have been fully considered but they are not persuasive.

The applicant argues that Stafford et al does not disclose a first layer of thermally conductive material that terminates at first layer ends on a cylindrical portion of an outer surface of a cell. The portions of the heat conductor inner layer "42" that form the interface between the two half shells is construed as the first layer ends. Therefore, claims 9 and 12 still read on the Stafford reference.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571) 272-0717. The examiner can normally be reached on M-F, 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

Art Unit: 1745

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC


JONATHAN CREPEAU
PRIMARY EXAMINER